PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

STRUCKMEIER ET AL.

Serial No.: 10/006,090

Filed: December 6, 2001

Examiner: Thomas Noland

Art Unit: 2881

MANUAL CONTROL WITH FORCE-FEEDBACK FOR PROBE MICROSCOPY-BASED FORCE SPECTROSCOPY ASSEMBLY

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop-Box Amendment - No Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22231-1450 on 5/24/05.

Thomas P. Vita, Jr.

Signature 5/24/2005 Date

DECLARATION OF BEN OHLER UNDER 37 C.F.R. §1.131

I, Ben Ohler, declare as follows:

1. I, along with Mr. Jens Struckmeier and Mr. Doug Gotthard (collectively "the inventors"), am an inventor of the subject matter of the above-captioned patent application.

2. I have reviewed the Office Action dated June 21, 2004, in the above-captioned patent application and the reference cited therein, namely, *Proksch et al.*, U.S. Publication No. 2004/0000189 (hereinafter the "*Proksch et al.* publication").

3. While employed by Veeco Instruments Inc. ("Veeco"), and at Veeco's facility situated at 112 Robin Hill Rd., Santa Barbara, CA 93117 (based on at least information and belief, the location for all events described herein), I, together with the other inventors, conceived and reduced to practice the Manual Control With Force-Feedback For Probe Microscopy-Based Force Spectroscopy system described and claimed in the above-identified application prior to the effective filing date of November 5, 2001, of the *Proksch et al.* publication (provisional application filing date).

4. Exhibit A is a true and correct copy of Veeco e-mail correspondence concerning the claimed invention, communicated between at least the inventors prior to the effective filing date of the *Proksch et al.* publication.

5. Exhibit B is a true and correct copy of engineering notebook pages prepared by me while at Veeco in developing the claimed invention, including the components listed in the e-mail correspondence of Exhibit A. These pages were produced prior to the effective filing date of the *Proksch et al.* publication, November 5, 2001.

6. Exhibits A and B illustrate the claimed features of the present invention, namely, in Exhibit A, the "knob" and "brake" listed in my e-mails, and in Exhibit B, the "knob" and "brake" shown in my engineering notebook pages, illustrate the claimed components (for instance, "manual input device" and "passive resistance device", respectively).

7. On at least information and belief, at all times at least one year prior to the filing date of the above-identified application, Exhibits A and B remained confidential to Veeco employees, including the inventors of the invention of the above-identified patent application.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code; and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 04/26/05

Ben Ohler

- - Date Redacted - -

Ben Ohler

From: Ben Ohler
Sent:
To: Doug Gotthard
Subject: connections for knob

Power: +/- 15V and +/- 5V (5v for electronics and 15V for brake and adding/subtracting from low V Z)

Inputs: Low V Z
Deflection

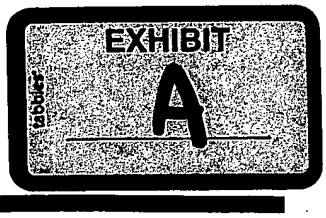
Ouputs: The new low voltage Z (The standard low V Z can be jumpered to this before the knob is in place)

Trigger inputs (through serial?): Set knob feedback force to zero (user sets when to do this in software)
Reset knob voltage offset to zero (user sets in software)

If the triggers through the serial port are too hard to implement we can always use buttons on the knob box.

I have a general scheme sketched out but it will take someone with more electronics knowledge than me to implement.

-Ben



- - Date Redacted - -

Ben Ohler

From: Ben Ohler
Sent:
To: Doug Gotthard; Jens Struckmeier; Bernd Maringer; Ben Ohler
Subject: Knob info on Zone

I have selected an enclosure, brake, and two possible encoders for the knob.

PDF spec sheets are on zone under "knob"

Bernd: The spec sheets for the encoder decoder chips are in the "encoder" folder off the main "knob" folder.

- - Date Redacted - -

Ben Ohler

From: Ben Ohler
Sent:
To: Bernd Maringer; Doug Gotthard; Jens Struckmeier
Subject: FYI: knob parts delivery

Enclosures (Nova 63 & Nova 127): Wednesday
Encoder (E4): Thursday
Encoder chip (LS7084): Thursday
Knob: Thursday
6V Brake: Thursday or Friday

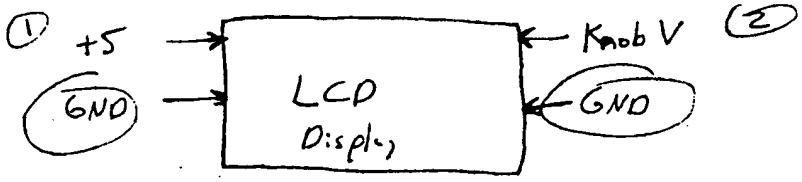
Pillar job

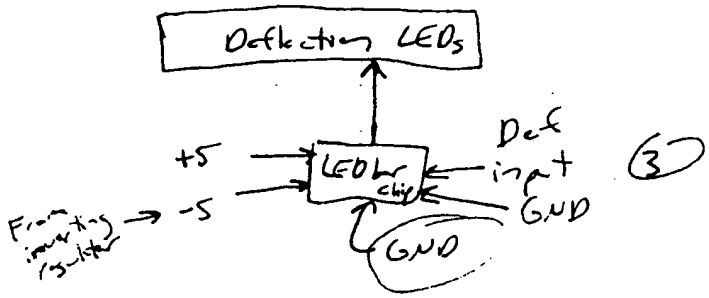
1873

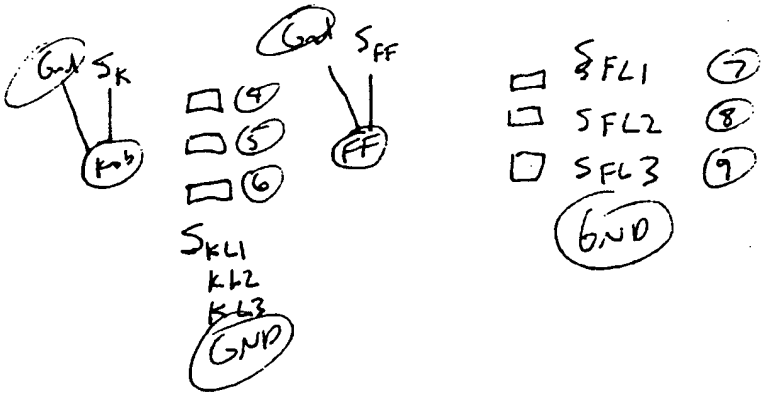
55-
001

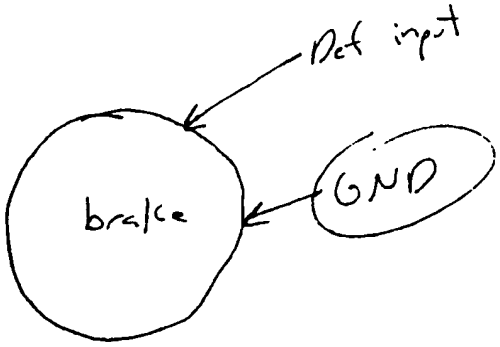
Knob box Required Lines

Sorting out signal routing for knob indicators, encoder & brake

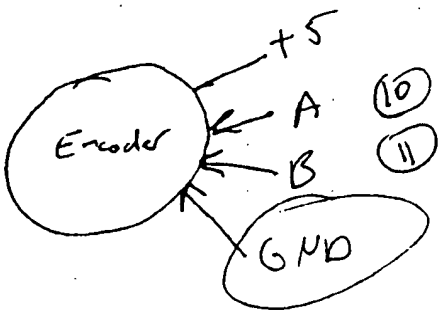








11 lines before GND



Sens	MinV	MaxV	Pk-Pk	Ramp	Non Lin
1315	4.48	5.56	1.08	1.42 μm	0.2
1388	3.98	6.04	2.06	2.86	0.15
1.41	3.50	6.52	3.02	4.26-7	0.15-0.25
1.38	2.96	7.08	4.12	5.7	0.25-0.3
1.4	2.48	7.56	5.08	7.12	0.3-0.~~35~~
1.39	1.96	8.08	6.12	8.54	0.35-0.
	1.52	8.72	7.20	9.95	0.45-0.5
	0.960	9.20	8.24	11.37	0.5-0.
	0.48	9.68	9.2	12.79	0.6-0.7
	0.08	10.1	10	13.94	0.65-0.7

0.1 -0

~~83~~ 1339 nm / V 1V / 18.3V = 73.2

73.2

PI controller (desktop)
- Closed Loop
- XY piezo tube (thin)
- Z piezo nut tuner

LowV	HighV	DeltaV	Ramp Size (um)	Non-lin (%) (+/- 0.1)	Sens (nm/V)
4.48	5.56	1.08	1.42	0.15	1314.81481
~~3.98~~	6.04	2.06	2.86	0.15	1388.34951
3.5	6.52	3.02	4.26	0.2	1410.59603
2.96	7.08	4.12	5.7	0.28	1383.49515
2.48	7.56	5.08	7.12	0.35	1401.5748
1.96	8.08	6.12	8.54	0.4	1395.42484
1.52	8.72	7.2	9.95	0.5	1381.94444
0.96	9.2	8.24	11.37	0.55	1379.85437
0.48	9.68	9.2	12.79	0.65	1390.21739
0.08	10.1	10.02	13.94	0.7	1391.21756

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Thomas P. Vita, Jr.

Signature 5/24/05
Date

DECLARATION OF DOUG GOTTHARD UNDER 37 C.F.R. §1.131

I, Doug Gotthard, declare as follows:

1. I, along with Mr. Ben Ohler and Mr. Jens Struckmeier (collectively "the inventors"), am an inventor of the subject matter of the above-captioned patent application.

2. I have reviewed the Office Action dated June 21, 2004, in the above-captioned patent application and the reference cited therein, namely, Proksch et al., U.S. Publication No. 2004/0000189 (hereinafter the "Proksch et al. publication").

3. While employed by Veeco Instruments Inc. ("Veeco"), and at Veeco's facility situated at 112 Robin Hill Rd., Santa Barbara, CA 93117 (based on at least information and belief, the location for all events described herein), I, together with the other inventors, conceived and reduced to practice the Manual Control With Force-Feedback For Probe Microscopy-Based Force Spectroscopy system described and claimed in the above-identified application prior to the effective filing date of November 5, 2001, of the Proksch et al. publication (provisional application filing date).

4. On information and belief, Exhibit A is a true and correct copy of Veeco e-mail correspondence concerning the claimed invention, communicated between at least the inventors prior to the effective filing date of the Proksch et al. publication.

5. On information and belief, Exhibit B is a true and correct copy of engineering notebook pages prepared by Mr. Ohler while at Veeco in developing the claimed invention, including the components listed in the e-mail correspondence of Exhibit A. These pages were produced prior to the effective filing date of the *Proksch et al.* publication, November 5, 2001.

6. Exhibits A and B illustrate the claimed features of the present invention, namely, in Exhibit A, the "knob" and "brake" listed in Mr. Ohler's e-mails, and in Exhibit B, the "knob" and "brake" shown in Mr. Ohler's engineering notebook pages, illustrate the claimed components (for instance, "manual input device" and "passive resistance device", respectively).

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Dated: 4/27/2005

Doug Gotthard

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Thomas P. Vita, Jr.

Signature 5/24/05 Date

DECLARATION OF JENS STRUCKMEIER UNDER 37 C.F.R. §1.131

I, Jens Struckmeier, declare as follows:

1. I, along with Mr. Ben Ohler and Mr. Doug Gotthard (collectively "the inventors"), am an inventor of the subject matter of the above-captioned patent application.

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Dated: 04/28/2005

Jens Struckmeier